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Colony of Seychelles.



ANNUAL REPORT

OF THE

DEPARTMENT OF AGRICULTURE

FOR THE

YEAR 1928.

Published by Command of His Excellency the Governor.



PRINTED BY THE SUPT. OF PRINTING,
AT THE GOVERNMENT PRINTING OFFICE,
Victoria, Mahé—Seychelles.

1929.

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CHAPTER I.

General Remarks.

During 1928 there was little change in the staff of the department except that the Inspector of Plantations went away on study leave in March to the Agricultural College of Trinidad where he is undergoing a refresher course at his own expense. He is expected to return to the Colony towards the end of 1929. He was replaced by one of the forest rangers who was the best qualified to perform his duties and the latter was in his turn replaced by an outsider.

Besides his duties of running a Botanic Station to which experimental plantations are annexed, the Director continued upkeeping several small gardens in Victoria, reafforesting the Crown lands above the Nioi reservoir, producing timber for the Public Works Department, examining plant diseases on estates, reporting on applications made by landed proprietors for crop privilege and mortgage loans, working a Licensable Board in connection with the sale and purchase of licensable produce, running an Excise Department and a small research laboratory. He was also for 6 months acting as J. P. in the Praslin District where he had to spend several days every month in connection with other duties. He was also appointed Chairman of the Fisheries Committee and, as usual, continued to serve as an ex-officio member of the Planters Association's Committee.

CHAPTER II.

Expenditure, Receipt, Sale and New Introduction of Plants, &c.

				Rs c.
Receipts from Plantations	...	...	...	248.71
Sale of timber from Crown Lands	...	...	...	1,819.00
Rents of Crown Lands and buildings	...	...	...	26,436.56
Royalty on Guano	...	...	...	21,998.00
Total Receipts				50,502.27

The total Expenditure under Agriculture and Crown Lands amounted to Rs 24,823.28.

This includes Rs 2,138.30 paid as premium for rat tails.

Attempts to introduce rare plants from other countries were continued. Among these the following were grown successfully:

1. Brazil nuts (*Bernolletia excelsa*) from Malaya.
2. Talipot palm *Corypha unbraculifera* from Ceylon.
3. Phoenix *Madagascariensis* (palm) „ Madagascar.
4. *Madenia nobilis* (palm) „ „
5. Sabal *Blackbunianum* (palm) „ New Guinea.
6. *Barringtonia edulis* „ „
7. *Casuarina Leptoclada* „ Kenya.
8. „ *torulosa* „ „
9. „ *glauca* „ „
10. *Eucalyptus saligna* „ „
11. „ *citriodora* „ „
12. Shea butter nut (*Buterospermum parkii*) from Sierra Leone.
13. *Eucalyptus* hybrids and *Pimenta acris* „ Mauritius.

A far greater number of other seeds was introduced without success. A feature in the garden is the number of palms already established which amounts to 58 species and for which the climate of this Colony is so favourable, judging from the composition of the wild jungle where the indigenous palms predominate. Palmyrah palms (*Borassus flabelliformis*) introduced from Ceylon and India in 1903 have fruited and when the first flowers appeared it was thought advisable to pollinate them with male flowers of the coco-de-mer, in order to try and obtain a hybrid between these two palms which have very likely evolved from a common ancestor. Female flowers of isolated coco-de-mer palms will soon also be pollinated with male flowers of the Palmyrah palm. Seychelles with its endemic coco-de-mer is supposed to have once formed part of a subsided continent adjoining India and Madagascar where the Palmyrah is indigenous. From an agricultural standpoint these two plants are not however very much similar; one, the coco-de-mer, is exacting in its requirements, while the other is a very hardy species of palm.

Among the plants introduced in 1902 from Malaya and Ceylon mention has to be made of the Mangosteen and Durian which have fruited abundantly during the year. They had already fruited before but very sparingly. This year hundreds of fruits of the two species were obtained but while the Mangosteen was much appreciated by one and all, although not yet perhaps as much as in Malaya, the Durian was declared to be an intolerable fruit by every body. One of the fruiting Durian trees which was in the way of a coco-de-mer palm was cut down and its timber has been declared by local sawyers as being very good. A great many seedlings of this beautiful tree will soon be set out in the jungle. The Mangosteen have produced many seedling fruits although most of them were as large as in Malaya. One of these trees, growing in damp soil which is supposed to be suitable for that species, was freed from subterranean rocks which impeded its growth by blasting them and it is supposed that the injury done by that means to its root system has led to an astonishing fructification of the tree.

Among the garden plants it may not be out of place here to also mention that the clump of giant orchid (*Grammatophyllum speciosum*) set forth not less than 20 spikes of flowers measuring 8 feet high. This specimen was introduced from Singapore in 1903 and had flowered several times already but not so profusely.

Another plant from the Far East which succeeds well in Seychelles is the Santol (*Sandoricum radiatum*). The fruits are so well appreciated by School boys that the latter become a nuisance during the whole time the trees are in bearing. This will promote dissemination of that very quick and hardy tree which I intend propagating on the worn out mountain sides of the Government reserves where they have made better growth than all other plants experimented with. A fine tree was felled and produced uncommonly good timber for such a quick growing plant.

CHAPTER III.

The Coconut Industry.

The crop of coconuts for the last 5 years may be apportioned as follows:—

	1924	1925	1926	1927	1928
Nuts converted into Copra ...	26,705,000	32,200,000	37,912,000	29,978,000	34,825,000
„ „ „ Oil ...	377,884	259,000	153,000	68,200	48,200
„ „ „ Soap ...	16,975	...	...	...	10,000
Nuts exported as such ...	177,884	61,000	83,000	12,500	27,500
Nuts consumed locally ...	4,000,000	4,000,000	4,000,000	4,000,000	4,000,000
	31,277,743	36,520,000	42,148,000	34,058,700	38,910,700

The crop for the year under review is the second best crop ever recorded. It is larger by nearly 5 millions nuts than that of last year. One of the factors governing the crop, i. e. the rainfall, has been more favourable than that of the previous year. The total rainfall affecting the crop of any one year should be reckoned from June to June and not from January to December. These good results were obtained in spite of a severe attack of scale insects which has reduced the crop by 50 % and more in many localities, especially on estates owned by small settlers where a severe infection means generally a set back of the whole crop, while on large estates the infected area is comparatively smaller although on two estates of over 150 acres the scale insects were found recently to have spread over as many as 60 acres at a time.

Usually blocks of a few acres only are infested periodically.

In 1905	the coconut crop	amounted to	18,946,531	nuts.
In 1916	"	"	"	27,759,942 "
In 1925	"	"	"	36,720,000 "

The steady increase is due to better methods of cultivation (cleaning, trench terracing, manuring) and to the adoption of better sanitary measures against diseases. The acreage under coconut remains approximately the same year by year. (21,000 acres). While few plantations are extended, others go practically out of cultivation owing to old age and loss of soil fertility.

In former days vanilla was grown on tree props as an intercalary crop between the rows of coconut palms. Nowadays vanilla has been replaced by perfume plants, mostly patchouli, and intercalary trees shading coconut palms are rarely seen on most estates. As patchouli has to be manured heavily to give a profitable crop, the palms are benefited in their turn by the manure which consists of cattle dung and distillery refuse. The leading planters are gradually using chemical fertilizers, mostly Nitrate of Potash and guano, and their example is already followed by other planters.

Cover crops such as *Centrosema pubescens* and two *desmodiums* are being adopted by planters with a view of checking erosion and restoring humus to worn out lands. Trench terracing is also being practised in many places in conjunction with the walling in of trees. These walls which allow the earthing up of the base of the trunk are at the same time instrumental in checking the attack of the melittomma beetle.

As there is very little cattle rearing in the Colony, the use of green manure by means of cover plants is expected to be generally adopted in order to make good the deficiency of cattle manure.

Very striking attacks of scale insects due to inferior soil conditions, lack of drainage or plant food are recorded. This is apparent on the mountain slopes where the ravages are more severe and on the coral flats which remain flooded a long time during the rainy season. A line of demarcation can be drawn between groves of palms remaining unhurt in the midst of badly infested plantations. This proves the absolute necessity of manuring the plantations and draining properly the coral flats if the ravages of scale insects are to be checked.

Other diseases: stem bleeding, melittomma, little leaf, &c., are under better control than formerly and the coconuts suffer much less from them. They are still, however, handicapped by poor soil conditions which pave the way for the invasion of scale insects. It should be added that the worst of these insects, besides several others, are indigenous to the Colony or recorded 20 years ago and that they have spread from the jungle to the coconut plantations after the land had been denuded by planters in search of firewood for their distilleries. There is no forest left in the Colony except a few wooded summits protected by Government. The native scale insects have therefore free access to the plantations which in former days were surrounded by groves of trees. Birds and predaceous insects have also disappeared for the same reason and this again has weakened the resistance of coconuts to scale insects.

Fortunately the entomogenous fungi which thrive in a wet country like Seychelles are keeping under control a few of the scale insects in question. Most of these fungi were discovered side by side with the *Coccidæ* and steps are being taken to introduce others (or to attempt to do so) for combating the present blight which has really assumed an alarming character.

It is often difficult to get rid of bad agricultural habits, but many planters fully realize already the dangerous position in which the Colony has been placed by deforestation and by allowing diseases of plants to spread without checking them. It will take some time to decide them to devote enough space between the palms to their plantations, which are overcrowded, and to do away with certain wrong methods of cultivation.

As an example, I can quote the singular theory which is being held by some of them by which it is pretended that nothing improves a coconut plantation on coral flats more than an intercalary growth of casuarina trees. It is very possible that trees thus set out are instrumental in breaking the hardpan by means of their roots and restore a little humus, but I am afraid that the real position of affairs is obliterated by the profit realized by the sale of firewood obtained thereby and that no sufficient notice is given to the corresponding shortage of coconut crops. Planters who adopt such a wrong theory are labouring under a dangerous illusion. There are other less risky means of improving a coconut estate.

The practice of interplanting young palms in old plantations in Seychelles should also be done away with. It is not uncommon to see young trees being set out when the old ones are tall enough to make room for them underneath. Three generations of trees are thus grown in fields which can stand a limited number of palms only. Not only is this practice detrimental to the old trees which have to share their plant food with young ones and which are handicapped from want of space for the development of their roots and leaves, but the young trees themselves growing under shade are weak and liable to diseases, never becoming good bearing trees. It is an established fact that young palms growing under tall ones are subject to an accumulation of dirt falling from the overhanging trees and that this dirt is the best medium for the maintenance of saprophytic fungi and the transformation of these inoffensive organisms into parasitic forms which in the great majority of cases lead to the so-called bud rot. The arrangement of the whorl of leaves in coconut palms forms an ideal receptacle for this accumulation of dirt just in the spots near the cabbage where the infection of the growing bud offers less resistance to parasites.

This practice was no doubt inaugurated with an idea of having in stock, ready to bear, young palms already grown in the midst of old ones which owing to diseases may become short lived. But this is turning in a vicious circle since it is easier to protect the old palms from the attack of the melitomma beetle which causes 90 o/o of the death of palms in Seychelles than to establish several generations of palms which are bound to suffer from worse epidemic diseases and thus create new centres of infection. The melitomma beetle disease is not epidemic and is easily combated by walling in or earthing up the base of the stems at a cost of a few cents per tree, while epidemic diseases may lead to the extermination of large plantations in toto.

Chapter IV.

The Vanilla Industry.

The export of vanilla beans amounted to 1,311 kos as compared with 3,245 kos in 1927 and 551 kos in 1926. At one time Seychelles used to produce 30 to 60 tons of vanilla. This article was driven from the market by the cheaper substitute, vanillin, which is made from Eugenol. The culture of the orchid was gradually abandoned and is now relegated to a few estates mostly in drier Praslin districts where it still finds favour among a few expert planters. Vanilla disease is not so rife in dry districts. The cost price of beans amounts to Rs 3 a lb and the selling price is hardly above that figure on the spot. The best vanilla plantations in Praslin are found at the back of madreporic flats which are silted up by numerous streams running down the hills. A mixture of coral sand, humus and small stones forms on these flats an ideal soil for the culture of vanilla when it is well drained. During years of favourable rainfall a large crop of over 50 lbs per acre allows these planters to make up for years of deficiency. In other parts of the colony where the soil is not so good crops are too small and irregular to justify any attempt towards profitable vanilla culture.

Chapter V.

The Essential oil industry.

It is precisely the fall in the market price of vanilla beans which stimulated in Seychelles the production of another intercalary crop between the rows of coconut palms. On the low hill sides cinnamon bushes are left growing between the palms in spite of the great inconvenience of this practice, and on the flats patchouli has been adopted with better results. On the high mountain sides where coconut culture is handicapped by permanent moisture and shallow soil, cinnamon is the perfume plant which is the best adapted. A little basilic (*Ocimum basilicum*), lemon grass (*Cymbopogon citratus*), citronella (mostly *C. flexuosus*) is grown here and there, while Palmarosa grass (*C. Martini*), Ylang Ylang (*Cananga odorata*) and Peppermint (*Mentha piperita*) are being experimented with. Among the latter plants Ylang Ylang requires deep alluvial flats which are very seldom found in the colony; palmarosa requires full exposure to the sun and it was found that Mitcham peppermint kept trailing on the ground and was choked by weeds. Up to now the planters have been accustomed to the culture of jungle plants and hardy grasses like citronella and the culture of more delicate plants which require garden treatment does not appeal much to them.

It was found desirable to experiment with other peppermints and towards the end of the year I was fortunate enough in receiving from Kew Gardens a few roots of the Japanese peppermint (*Mentha arvensis*) which arrived in excellent condition. Although this plant is deficient in thymol it is more erect and bushy than the English Mitcham peppermint and the two plants will be kept growing in the Botanic Gardens, should a fall in the market price of other oils compel the planters to devote their attention to other perfume plants of an herbaceous nature.

Both the Director of Kew Gardens and Dr Harold Brown of the Imperial Institute have however guarded me against the uncertainty of the market price of the Japanese peppermint oil which contains Menthol instead of Thymol. The latter is the chief constituent of Mitcham peppermint. Menthol is much more subject to the increasing competition of a synthetic substitute than thymol.

Considerable difficulty was experienced during the year regarding the sale of Seychelles patchouli oil which was pronounced to be inferior to the Penang oil owing to a greater insolubility in alcohol. Application has been made to the Director of Kew Gardens and to the Director of the Imperial Institute for guidance, as it may be that our patchouli, which is exactly the same plant as that grown in Penang and in other parts of Malaya, has acquired different constitutional properties under the influence of the climate and soil of this colony. There are so many factors which influence the composition of essential oils that it was considered advisable to submit this question to the authorities in England, as the Seychelles planters have become experts in the culture and distillation of patchouli, the whole process of manufacture being carried on on much the same lines as in Penang. It is true that locally patchouli plantations are heavily manured with cinnamon distillery refuse, but this method of manuring can hardly have much influence on the physical properties of the distillate. It is also well known that even in Penang patchouli is sometimes insoluble in alcohol just as in Seychelles.

The position of cinnamon leaf oil on the market has considerably improved and the local price per litre which amounted at the beginning of this year to Rs 4 has increased soon after to Rs 8 which is a very remunerative price. It is not clearly understood why the fluctuation of the market for this commodity is so great. It may be that it is sometimes influenced by the market price of clove oil which is being manufactured on a greater scale than formerly in Madagascar from leaves and in Europe from clove imported from Zanzibar. The synthetic production of Eugenol from other sources, mostly guaiacol and Safrol, which is a waste product of the camphor distilleries, may also have influenced the market price of cinnamon leaf oil. In Zanzibar 10,000 tons of clove are produced annually and in Madagascar the production of the same article will amount to 2,000 tons per annum within a few years. 50,000 litres of clove leaf oil are produced annually in Madagascar already and this production can be increased ten fold in the near future. It is therefore not understood how the price for cinnamon leaf oil and clove oil have lately increased so much. It is very likely that clove leaf oil will be sold at a low price within a few years and that Eugenol will be more cheaply manufactured from it than from Guaiacol or Safrol or Coniferin. This will create a demand for cheap clove oil and a corresponding fall in the price of vanillin and vanilla. The Government of Zanzibar has allowed a drawback on the clove intended for distillation and reduced the taxation in nature which handicapped so much the clove industry in that Colony. Steps are also being taken there to distil clove leaves and stems on the spot where it can be done more cheaply than in Madagascar. It is very likely that Seychelles will benefit from the efforts made in other colonies for the protection of the clove industries, owing to the great similarity which exists between clove leaf oil and cinnamon leaf oil, the percentage of Eugenol contained in both products being much the same.

The quantity of essential oils exported during the year under review exceeded that of previous years.

	1924	1925	1926	1927	1928
Cinnamon leaf oil, litres	32,216	42,241	44,723	59,007	59,807
„ bark „ „	140	19	...	...	33
Patchouli „ „	1,025	551	1,305	1,054	2,325
Basilic „ „	144	69	111	20	10
Lemon grass „ „	79	71	195	236	148
Clove oil „ „	1,025	3,800	...	49	...
	34,629	46,751	4,6334	60,366	62,323

CHAPTER VI.

The Rubber Enterprise.

19,172 lbs of rubber were exported in 1928 as compared with 19,338 lbs in 1927, 14,788 lbs in 1926 and 10,895 lbs in 1925.

That this Colony lends itself to the culture of Para rubber trees is beyond question, since the very low price prevailing on the market did not prevent the few planters who have not sacrificed their plantations for the sake of making firewood managed to produce as much rubber as last year and more than the preceding years. It is an industry well adapted to the small settlers and it would be a mistake to give it up entirely at a time when it is clearly shown that the small planters in the East derive so much advantage from it and gradually increase their plantations. Only hardy trees can be grown in the poor soils of this colony and among hardy trees coconut and Para rubber are unrivalled.

Chapter VII.

Entomological and Mycological Notes.

The scale insects, as already stated, mostly *pinnaspis buxi*, and *Ischnaspis filiformis*, are spreading to an alarming extent although there are signs which go to show that they are being more and more kept under control by fungus parasites. Many estates which are handicapped by poor soil conditions are suffering more than others and, in some cases, I consider that it is questionable whether coconut planting on the hill sides should not be done away with and replaced by other crops and timber trees. I am however under the impression that coconut palms are so hardy and so well adapted to this country that they seem to withstand the attack of scale insects more than other cultivated plants. Coconuts are, in fact, as hardy as timber trees and can stand an incredible amount of shade for a short period of time.

A programme is being drawn for the introduction of other fungus parasites and predaceous insects from abroad, but this can hardly be done on a sufficient scale before the Institute at Amani can give this Colony the necessary assistance. The authorities at the Imperial bureaux of Entomology and Mycology are being kept in touch with for guidance and full advantage will also be taken of the presence of the Inspector of plantations at the College of Trinidad for his proper training in the careful study of the biological problems with which the colony is confronted.

To a long list of scale insects attacking various plants, the following are added having been identified this year at the Imperial bureau of Entomology.

Coccus elongatus, Sign on Barbados and Bois noir *Aulacaspis pentagona*, T. T. mulberry, papaw &c.

This latter insect is already well known as one which renders papaw trees short lived in the colony. The experimental fields devoted to mulberry at the request of the Imperial Institute have been a failure in the low country at the Botanic Station owing to the attack of this scale insect which it has been impossible to keep under control by spraying. A small black lady bird beetle preys upon it but only to such a slight extent that it is not kept under control in that way. I am afraid that other parasites of this scale insect would have to be introduced from abroad, if the culture of mulberry tree for the rearing of silk worms is undertaken.

Chapter VIII.

Crown Lands.

The following plants were set out on Crown lands during the year.

Eucalyptus (Mauritius hybrid)	...	...	...	...	...	818
„ citriodora	...	...	...	...	...	14
„ saligna...	...	...	...	...	...	17
Casuarina equisetifolia	...	...	...	...	...	1,028
Casuarina glauca	...	...	...	...	...	77
Hydnocarpus anthelmintica	...	...	...	...	...	141
„ Wrightiana	...	...	...	...	...	30
Adenanthera pavonina	...	...	...	...	...	300
Chrysobolanus icaco (coco plum)	...	...	...	...	...	525
Citrus and other fruit trees	...	...	...	...	...	366
Parkia Roxburghii	...	...	...	...	...	225
Pterocarpus indica	...	...	...	...	...	85
Palms (various)	...	...	...	...	...	210
Flamboyant (<i>Poinciana regia</i>)	...	...	...	...	...	72
Kapok (<i>Eriodendron anfractuosum</i>)	...	...	...	...	...	12
Mangoes	...	...	...	...	...	12
Cassia manille (<i>Pithecolobium dulce</i>)	...	...	...	...	...	88
Guango (<i>Pithecolobium Saman</i>)	...	...	...	...	...	33
Clove (<i>Eugenia caryophyllata</i>)	...	...	...	...	...	250
Santol (<i>Sandoricum radiatum</i>)	...	...	...	...	...	198
Gum Copal (<i>Trachylobium verrucosum</i>)	...	...	...	...	...	250
Sang dragon (<i>Pterocarpus indica</i>)	...	...	...	...	...	90 (cuttings)
Barbados cherry (<i>Malpighia glabra</i>)	...	...	...	...	...	30
Cola (<i>Cola acuminata</i>)	...	...	...	...	...	50

The following amount of timber was supplied to the Public Works Department at cost price. This timber was obtained from the Government reserves :—

4,801 feet bois rouge planks.

9,111 „ capucin posts.

This supply cannot last for a long time unless the forest canopy is interfered with. A larger supply would mean giving a chance to the rank growth of coarse weeds and bracken ferns by exposure of the land and increasing the cost of reafforesting. The trees felled are however selected from those that have reached maturity or are handicapped by poor conditions of growth.

Hard wood timber will soon no longer be available.

Arrangements should be made at an early date for importation of timber, preferably from Madagascar, where the trees exploited are nearly allied to those of Seychelles and which is the only country exporting timber in the neighbourhood.

Chapter IX.

Fisheries.

The exports from the outlying islands amounted to :—

Guano	tons 15,400	declared value	Rs 461,760
Tortoise shell	ks 1,041½	„ „	28,536
Calipee	„ 4,165	„ „	4,707
Shark fins	„ 1,027	„ „	1,214
Trepangs	„ 2,320	„ „	2,669
Green turtle shell	„ 698	„ „	418
Salt fish	„ 600	„ „	150
Turtle strips	„ 552	„ „	331
Yolk and albumen of birds eggs	„ 15,784	„ „	7,368
			<hr/> 507,153 <hr/>

A Fisheries Committee was appointed during the year to report on the recommendations of Mr James Hornell and to submit other recommendations of their own. As a result of their deliberations a new ordinance, embodying these recommendations, is being prepared by the Legal Adviser.

It will be prohibited to fish with large seines in the reserves of Mahé, Praslin, and La Digue which are the principal inhabited islands, except as regards mackerel and sardines, when these fishes happen to enter the reserves in shoals.

The cordonnier (*Teuthis Oramin*, Block) Breton (*Gerres acinaces*, Bleeker) and rouget (*Upeneoides* spp.) whose life history and spawning grounds are a little known, are specially protected by means of a close season and size limit. The protection of other fishes, which are mostly off shore fishes as regards size limit will be abolished, so long as their life history will remain unknown.

A close season of 3 months duration will be provided for the green turtle, but it has not been found advisable to suggest a close season for the hawksbill turtle as there is no definite proof that the fishing grounds of these reptiles are depleted. A close season for such animals should be a long one of several years' duration as the shells can be concealed for a long time without deterioration and put on the market at the end of the close season. A long close season, on the other hand, may deprive the home market of a well known article which may lose its reputation or be substituted for in the meanwhile. The only other measures of protection will provide for the prohibition of harpooning either males or females within 1,000 metres from the shore, whether there is a reef or not fringing the beach. There is one barrier reef in the Archipelago, several atolls and fringing reefs here and there and the different reefs and shallow foreshores with their delimitations are not well understood by the fishermen. Besides, no gravid females will be prevented in this way from coming ashore to lay their eggs. Nowadays the "vareurs" come alongside the beach during the breeding season and spend nights and days watching the reptiles and spearing them at random from their canoes in the face of the owners of the islands who are thus deprived sometimes from a serious source of revenue. Hitherto a distinction was made in the law as regards the sex of the reptiles and the males were allowed to be speared by the "vareurs". It has been proved to the Committee that it is impossible to distinguish between a male and a female at sea before it has actually been speared.

The law also provides for the protection of berried females of crabs and camarons.

The reports by Mr Hornell were very useful to the Committee. They went to give a complete account of the fishing grounds and methods of fishing in the colony, besides enumerating the numerous ordinances already passed and the results obtained therefrom.

The market of Mauritius for salt fish has practically been abandoned from want of direct steam communication and from competition with Rodrigues and South African cured fish which are already glutting the market of that Colony.

The market of Kenya for fresh fish with cold storage accomodation has been tapped with better results by an enterprising firm, but there is a doubt that this latter colony will not one day be provided with its own provision of fish. A preliminary report by an expert biologist has recently shown that promising fishing grounds, even susceptible of being trawled, exist in that colony where hitherto 20 tons of fresh fish only are said to be captured per annum. It is considered that Seychelles is in a position to supply the market of Kenya with fresh fish for several years to come.

The market of Bombay where the demand for wet cured fish is unlimited has not yet been tapped. This method of curing fish although well known in the Colony is not a popular one, as compared with the dry curing methods.

Birds' eggs have been exported this year to the amount of over 7 tons. It is the yolk of the eggs of the sooty tern, which is simply salted and preserved by boric acid. It has not been possible to export also the white or albumen of these eggs, as this necessitates a more careful and lengthy preparation on uninhabited islands. The demand for birds' eggs in the Colony for local consumption is great but the breeding season is of too short duration to allow all the eggs being disposed of in that way. It seems to be advisable to establish in this Colony sanctuaries for the protection of useful birds which are becoming more exposed to extinction, since their eggs are collected on such a scale. The Archipelago with its 98 islands seems to lend itself to the establishment of such sanctuaries, one in each group of islands.

During the year I visited one of the outlying Islands and was struck by the careless measures adopted thereon for the exploitation of its guano deposits. The whole island, except the newly formed sand cays, was covered formerly with guano deposits to a depth of about one foot and it was in this single foot of surface soil that an abundant crop of coconuts was obtained. The soil below is a hardpan. Can it be believed that the whole of this guano is being exported, only about 15,000 tons remaining, with a profit of only a few shillings a ton; when on the other hand the coconut palms are being deprived of a fertilizer which makes them produce an income representing 5,000 tons of guano at least per annum. This is simply tending to deprive for ever the local inhabitants of their means of subsistence for a small profit of short duration. Islands on which good coconut plantations covering the whole ground exist should not be exploited for their guano deposits. They are inhabited islands and being inhabited the flocks of birds which once were responsible for the formation of the guano deposits have as usual been driven off. Astonishing crops of coconuts are obtained on such islands which strike visitors as being gardens of Eden owing to unlimited other resources which actually follow good harvests. Once they are deprived of the guano deposits, not only are the crops reduced 5 to 10 times in a short time, but this shortage of crops is invariably accompanied by a cortege of other evils following bad harvests. There are other islands of the archipelago where the same state of affairs should be guarded against.

Chapter X.

Excise Return.

All Government notifications, ordinances and regulations relating to the cultivation of sugar cane and the manufacture of bacca were repealed and a new Ordinance was passed and came into force on the 5th November 1928. Under this new ordinance, the manufacturers of bacca, as well as the retailers, have to keep registers and account for the storing and sale of that beverage which has to be manufactured in places open to public view. The manufacturers had been hitherto allowed to run a mill on their estate in places more or less concealed without a severe check on the amount of bacca sold by them with the result that some of them were caught selling more bacca than they could possibly have produced on their plantations. Sophistication by adding sugar and water to the cane juice was thus found to be rife. Manufacturers will no longer be able to sell their bacca on credit and to deliver it free of charge and retailers are now prevented under the new ordinance from selling more than a litre of bacca at a time for consumption outside their shop except with a special permit from the Inspector of Police.

The area under cultivation and for which a license of Rs 250 has to be taken amounts to 32 5/10ths arpents and 997 square feet as compared with 34 5/10ths and 2,652 square feet in 1927.

The number of bacca mills registered during the year amounted to 26 and 27 licenses were issued to retailers of bacca.

The number of essential oil distilleries for which a license of Rs 60 per annum (Ordinance No. 1 of 1923) amounted to 55 as compared with 32 last year.

The revenue derived from the taxes and licenses are :—

Sugar cane plantations (Rs 250 per acre)	Rs 8,144.94
Bacca mills (Rs 100 p. a.)	„ 2,600.00
Tax on mill oxen (Rs 6 p. a.)	„ 156.00
Bacca shop licenses (Rs 180 p. a.)	„ 4,860.00
Essential oil distilleries (Rs 60 p. a.)	„ 3,350.00

Total ... Rs 19,110.94

P. R. DUPONT,
Director of Agriculture.

